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PCT/CA 2004/00577

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THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

April 28, 2004

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APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A
FILING DATE UNDER 35 USC 111.**

APPLICATION NUMBER: 60/463,349

FILING DATE: April 17, 2003

**PRIORITY
DOCUMENT**

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04/17/03

6014-533-417 (10-01) 70
 Approved for use through 10/31/2002. OMB 0651-0032
 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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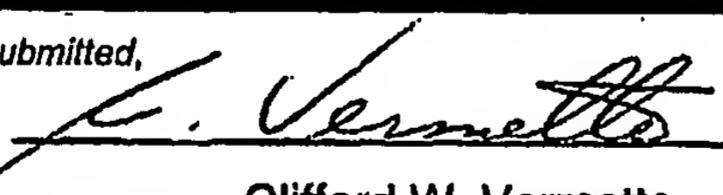
PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No. *Alpha*

INVENTOR(S)				
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)		
Gerald	Dyck	Abbotsford, Canada		
Paul	Dries	Coquitlam, Canada		
Brent	Snipstead	Mission, Canada		
<input type="checkbox"/> Additional inventors are being named on the _____ separately numbered sheets attached hereto				
TITLE OF THE INVENTION (500 characters max)				
SWING BOOM PIVOT MECHANISM				
Direct all correspondence to:		CORRESPONDENCE ADDRESS		
<input type="checkbox"/> Customer Number	→		Place Customer Number Bar Code Label here	
OR	Type Customer Number here			
<input checked="" type="checkbox"/> Firm or Individual Name	Vermette & Co.			
Address	Box 40, Granville Square			
Address	Suite 230, 200 Granville Street			
City	Vancouver	State	British Columbia	ZIP
Country	Canada	Telephone	604-331-0381	Fax 604-331-0382
ENCLOSED APPLICATION PARTS (check all that apply)				
<input checked="" type="checkbox"/> Specification	Number of Pages	7	<input type="checkbox"/> CD(s), Number	
<input checked="" type="checkbox"/> Drawing(s)	Number of Sheets	5	<input type="checkbox"/> Other (specify)	
<input type="checkbox"/> Application Data Sheet. See 37 CFR 1.76				
METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT				
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27.				FILING FEE AMOUNT (\$)
<input type="checkbox"/> A check or money order is enclosed to cover the filing fees				
<input type="checkbox"/> The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number:				\$80.00
<input checked="" type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.				
The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.				
<input type="checkbox"/> No.				
<input type="checkbox"/> Yes, the name of the U.S. Government agency and the Government contract number are: _____				

Respectfully submitted,

SIGNATURE 

TYPED or PRINTED NAME Clifford W. Vermette

TELEPHONE 604-331-0381

Date 04/16/2003

REGISTRATION NO.
(if appropriate)
Docket Number:

30,018

2252-104

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is used by the public to file (and by the PTO to process) a provisional application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the complete provisional application to the PTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C. 20231.

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FEE TRANSMITTAL for FY 2003

Effective 01/01/2003. Patent fees are subject to annual revision.

 Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$ 80.00)

Complete if Known

Application Number	
Filing Date	
First Named Inventor	Gerald Dyck
Examiner Name	
Art Unit	
Attorney Docket No.	2252-104

METHOD OF PAYMENT (check all that apply)

 Check Credit card Money Order Other None
 Deposit Account:

Deposit Account Number
Deposit Account Name

The Commissioner is authorized to: (check all that apply)

 Charge fee(s) indicated below Credit any overpayments
 Charge any additional fee(s) during the pendency of this application
 Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity	Small Entity	Fee Code (\$)	Fee Code (\$)	Fee Description	Fee Paid
1001 750	2001 375	Utility filing fee			
1002 330	2002 165	Design filing fee			
1003 520	2003 260	Plant filing fee			
1004 750	2004 375	Reissue filing fee			
1005 160	2005 80	Provisional filing fee	80.00		
SUBTOTAL (1) (\$ 80.00)					

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims	Independent Claims	Multiple Dependent	Extra Claims	Fee from below	Fee Paid
			-20** =	<input type="text"/> X <input type="text"/> = <input type="text"/>	
			- 3** =	<input type="text"/> X <input type="text"/> = <input type="text"/>	
				<input type="text"/> = <input type="text"/>	

Large Entity	Small Entity	Fee Code (\$)	Fee Code (\$)	Fee Description
1202 18	2202 9	Claims in excess of 20		
1201 84	2201 42	Independent claims in excess of 3		
1203 280	2203 140	Multiple dependent claim, if not paid		
1204 84	2204 42	** Reissue independent claims over original patent		
1205 18	2205 9	** Reissue claims in excess of 20 and over original patent		
SUBTOTAL (2) (\$ 0.00)				

**or number previously paid, if greater. For Reissues, see above

3. ADDITIONAL FEES

Large Entity Small Entity

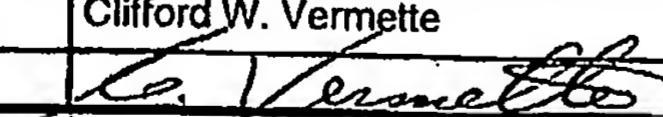
Fee Code (\$)	Fee Code (\$)	Fee Description	Fee Paid
1051 130	2051 65	Surcharge - late filing fee or oath	
1052 50	2052 25	Surcharge - late provisional filing fee or cover sheet	
1053 130	1053 130	Non-English specification	
1812 2,520	1812 2,520	For filing a request for ex parte reexamination	
1804 920*	1804 920*	Requesting publication of SIR prior to Examiner action	
1805 1,840*	1805 1,840*	Requesting publication of SIR after Examiner action	
1251 110	2251 55	Extension for reply within first month	
1252 410	2252 205	Extension for reply within second month	
1253 930	2253 465	Extension for reply within third month	
1254 1,450	2254 725	Extension for reply within fourth month	
1255 1,970	2255 985	Extension for reply within fifth month	
1401 320	2401 160	Notice of Appeal	
1402 320	2402 160	Filing a brief in support of an appeal	
1403 280	2403 140	Request for oral hearing	
1451 1,510	1451 1,510	Petition to Institute a public use proceeding	
1452 110	2452 55	Petition to revive - unavoidable	
1453 1,300	2453 650	Petition to revive - unintentional	
1501 1,300	2501 650	Utility issue fee (or reissue)	
1502 470	2502 235	Design Issue fee	
1503 630	2503 315	Plant Issue fee	
1460 130	1460 130	Petitions to the Commissioner	
1807 50	1807 50	Processing fee under 37 CFR 1.17(q)	
1808 180	1808 180	Submission of Information Disclosure Stmt	
8021 40	8021 40	Recording each patent assignment per property (times number of properties)	
1809 750	2809 375	Filing a submission after final rejection (37 CFR 1.129(a))	
1810 750	2810 375	For each additional invention to be examined (37 CFR 1.129(b))	
1801 750	2801 375	Request for Continued Examination (RCE)	
1802 900	1802 900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$ 0.00)

SUBMITTED BY

Name (Print/Type)	Clifford W. Vermette	Registration No. (Attorney/Agent)	30,018	Telephone 604-331-0381
Signature		Date	April 16, 2003	

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

This collection of information is required by 37 CFR 1.17 and 1.27. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

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SWING BOOM PIVOT MECHANISM

FIELD

The present invention relates to an improved attachment method for mounting a pivot base to the boom
5 assembly on a Swing Boom Assembly used on a skidder.

BACKGROUND OF THE INVENTION

Skidders are used in the forest industry to retrieve and load felled trees. Most consist of a prime mover, and a grapple attached to the end of a boom. Booms are
10 typically mounted to the prime mover through a fixed base allowing movement in a vertical plane. Side to side movement is accomplished through movement of the prime mover. Added maneuverability can be obtained by adding a pivoting base to which the boom is attached allowing the
15 boom to swing about a vertical axis relative to the prime mover. This type of boom is commonly referred to as a Swing Boom Assembly.

The method of mounting the pivot base to the boom
20 assembly becomes critical to prevent overloading of

components. The boom assembly includes the boom, boom cylinder and grapple.

Referring to Figures 1-4, a conventional method of
5 attaching the main body 30 of a pivot base 22 to the boom assembly 32 of a swing boom 11 is shown. A horizontal pin 24 and boom cylinder 26 connect the boom 28 to the pivot base 22. The horizontal pin 24 allows the boom 28 to move vertically through a circular arc relative to the pivot
10 base 22. The extension of the boom cylinder 26 controls the amount of vertical motion of the boom 28.

The pivot base 22 further comprises an upper spherical bearing 34, lower spherical bearing 36, and a swivel
15 actuator 38. The upper spherical bearing 34, and lower spherical bearing 36 permits the main body 30 of the pivot base 22 to rotate about a vertical axis relative to the fixed base 40. The swivel actuator 38 controls the amount
20 of horizontal rotation of the pivot base 22 and boom 28 about the vertical axis.

As shown in Figure 1, conventional designs incorporate an upper pivot shaft 42, and lower pivot shaft 44 rigidly

attached to the main body 30 of the pivot base 22. The upper pivot shaft 42 passes through the upper spherical bearing 34, and the lower pivot shaft 44 passes through the lower spherical bearing 36. The outer races of the upper 5 and lower spherical bearings 34 and 36 are rigidly attached to the fixed base 40.

As best shown in Figures 2-4, the upper pivot shaft 42 extends past the upper spherical bearing 34. A clevis joint 46 is used to connect the boom cylinder 26 to the upper pivot shaft 42. The line of action of the boom cylinder 26 passes through the upper pivot shaft 42 above the upper spherical bearing 34 creating an overhung loading condition. Depending on the particular loading and position of the boom assembly 32 in the vertical plane, stresses due to the bending moment can become excessive, especially at the connection between the upper pivot shaft 42 and the main body 30 (see Figure 4). As a result, the conventional method of attachment can lead to cracking and failure of the components comprising the vertical axis of the pivot base under severe operating conditions. As such, there is a need for an improved attachment method for mounting the pivot base to the boom assembly.

SUMMARY OF THE INVENTION

The present invention relates to an improved attachment method for mounting the pivot base to the boom 5 assembly on a Swing Boom Assembly used on a skidder. The boom assembly is attached at the top end of the main body of the pivot base, such that the stress on the pivot base as a result of the bending moment is substantially reduced from the conventional method of attachment.

10

BRIEF DESCRIPTION OF THE DRAWINGS

Further features and advantages of the invention will be apparent from the following detailed description, given by way of a preferred embodiment taken in conjunction with 15 the accompanying drawings, wherein:

Figure 1 is a vertical sectional view through the middle of the prior art conventional pivot base connection;

Figure 2 is a perspective view of the prior art conventional pivot base connection;

20 Figure 3 is a side view of the prior art main body of pivot base and conventional upper joint;

Figure 4 is a sectional view along line 1-1 of Figure 3;

Figure 5A is a perspective view of an improved Swing Boom Assembly in a neutral pivot position;

Figure 5B is a perspective view of an improved Swing Boom Assembly rotated counter clockwise;

5 Figure 6 is a vertical sectional view through the middle of the improved pivot base connection;

Figure 7 is a perspective view of the improved pivot base connection;

Figure 8 is a side view of the main body of the pivot base and improved upper joint; and

10 Figure 9 is a sectional view along line 2-2 of Figure 8.

DETAILED DESCRIPTION OF THE INVENTION

15 Referring to Figures 5A and 5B the movement of the main parts of a swing boom 13 are shown. A fixed base 52 is mounted rigidly to the prime mover (not shown). The boom assembly 60 is attached to the pivot base 46. The boom assembly 60 includes the boom 59, boom cylinder 58, 20 and grapple (not shown). The grapple attaches to the boom 59 at the grapple attachment point 16. The pivot base 46 rotates from side to side as shown by double sided arrow 20 in Figure 5A. The pivot base 46 is shown rotated counter

clock wise in Figure 5B. The extension of the boom cylinder 58 controls the amount of vertical motion of the boom 59. The boom 59 may move in a horizontal plane with the movement of the pivot base 46 as shown by arrows 20, as 5 well as a vertical plane as illustrated by arrows 21 in Figure 5B.

Referring to Figures 6-9, an improved design for the attachment of the main body 54 of a pivot base 46 to the 10 boom assembly 60 of a swing boom 13 is shown. The boom assembly 60 is mounted to the main body 54 of the pivot base 46. The pivot base 46 is modified from the conventional method described in connection with Figures 2-5 at the upper pivot shaft 48. Similar to the conventional 15 method, the outer race of the upper spherical bearing 50 is rigidly mounted to the fixed base 52. However, the main body 54 of the pivot base 46 is extended forming an integral clevis around the upper spherical bearing 50, and both ends of the upper pivot shaft 48 are rigidly mounted 20 to the main body 54 (see Figure 9). Advantageously, the new geometry substantially reduces the bending moment on the upper pivot shaft 48 relative to the main body 54, and resultant stresses in the upper pivot shaft 48.

Accordingly, while this invention has been described with reference to illustrative embodiments, this description is not intended to be construed in a limiting sense. Various modifications of the illustrative 5 embodiments, as well as other embodiments of the invention, will be apparent to persons skilled in the art upon reference to the description. It is therefore contemplated that the appended claims will cover any such modifications or embodiments as fall within the true scope of the 10 invention.

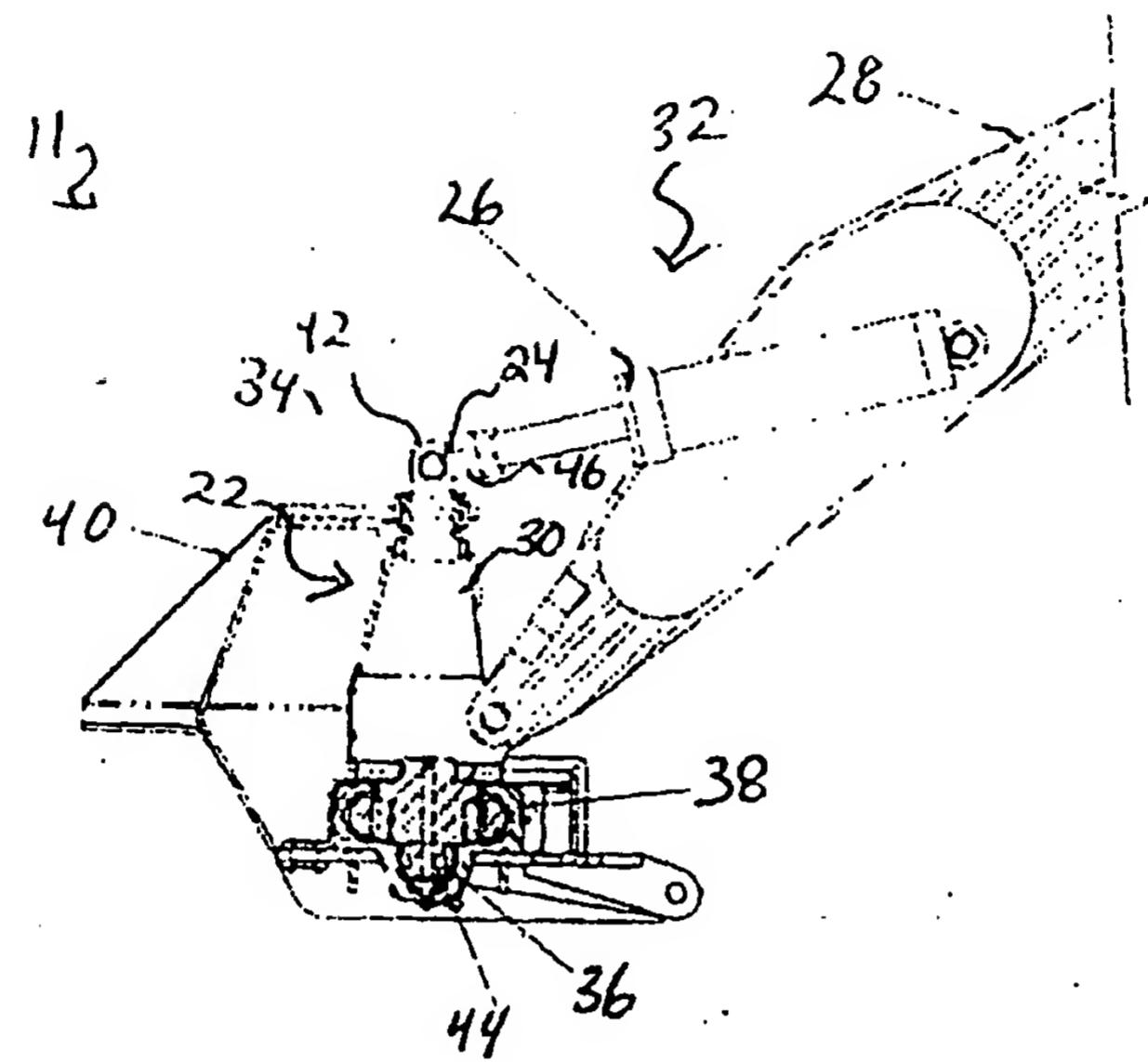


FIGURE 1 - PRIOR ART

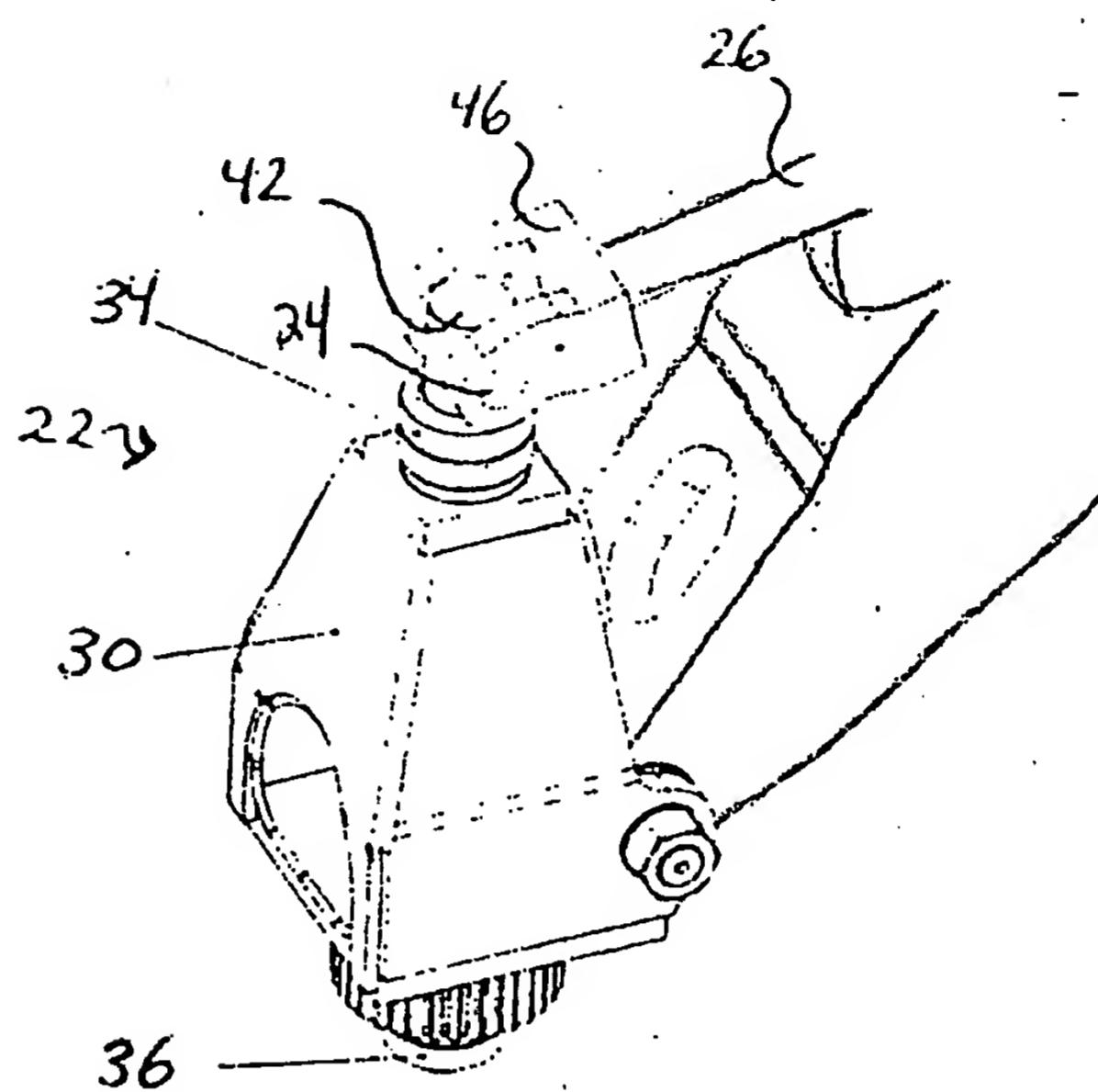


FIGURE 2
PRIOR ART

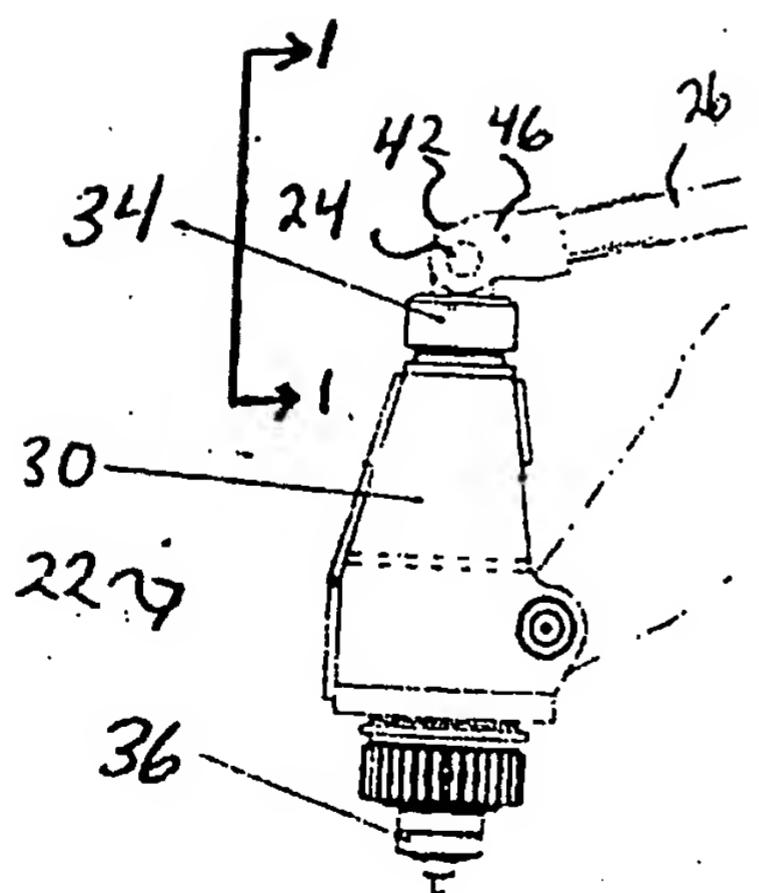


FIGURE 3
PRIOR ART

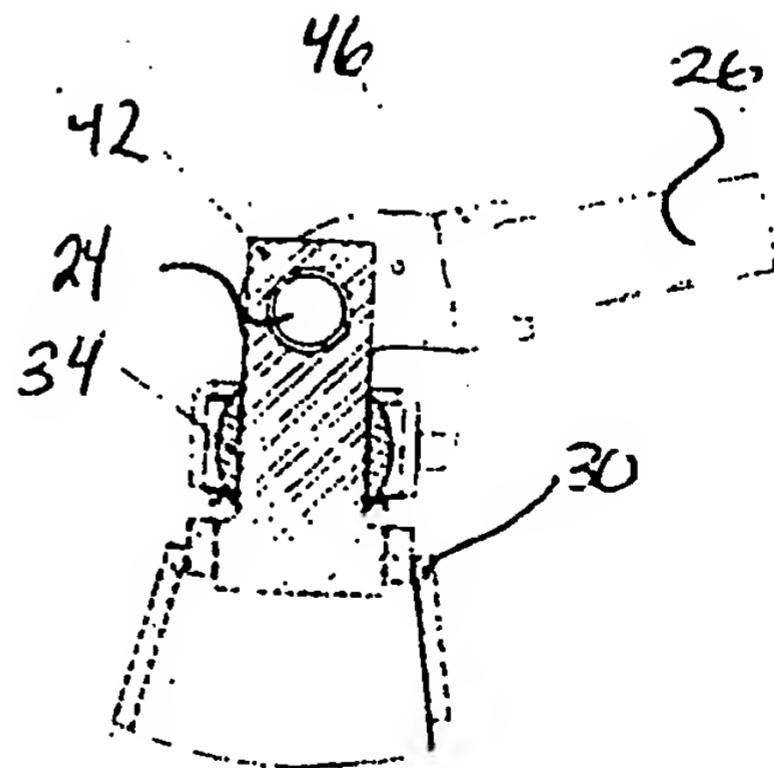


FIGURE 4
PRIOR ART

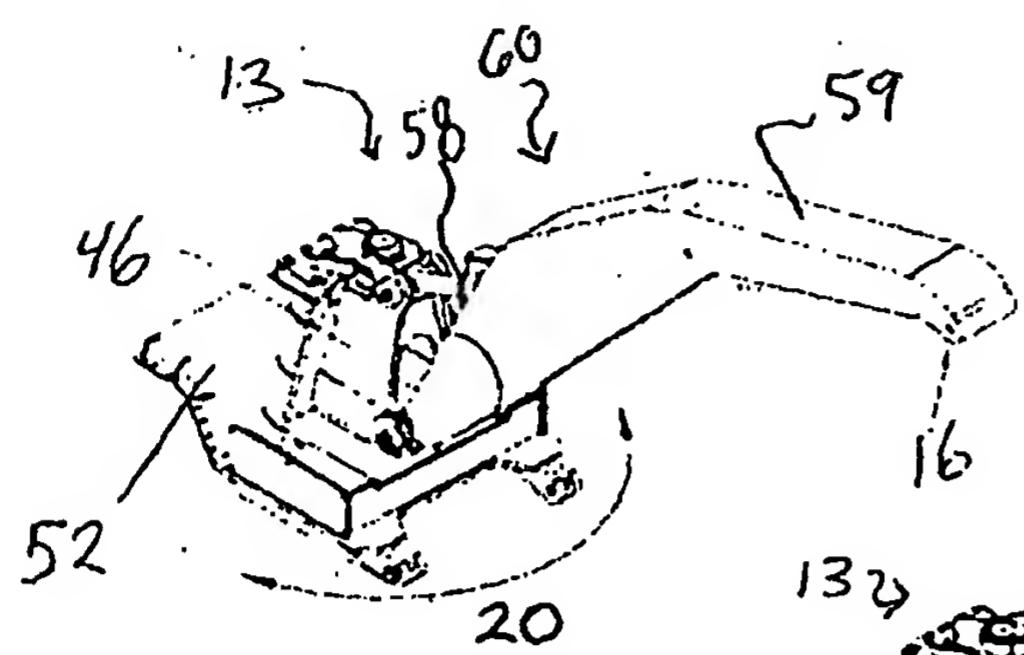


FIGURE 5A

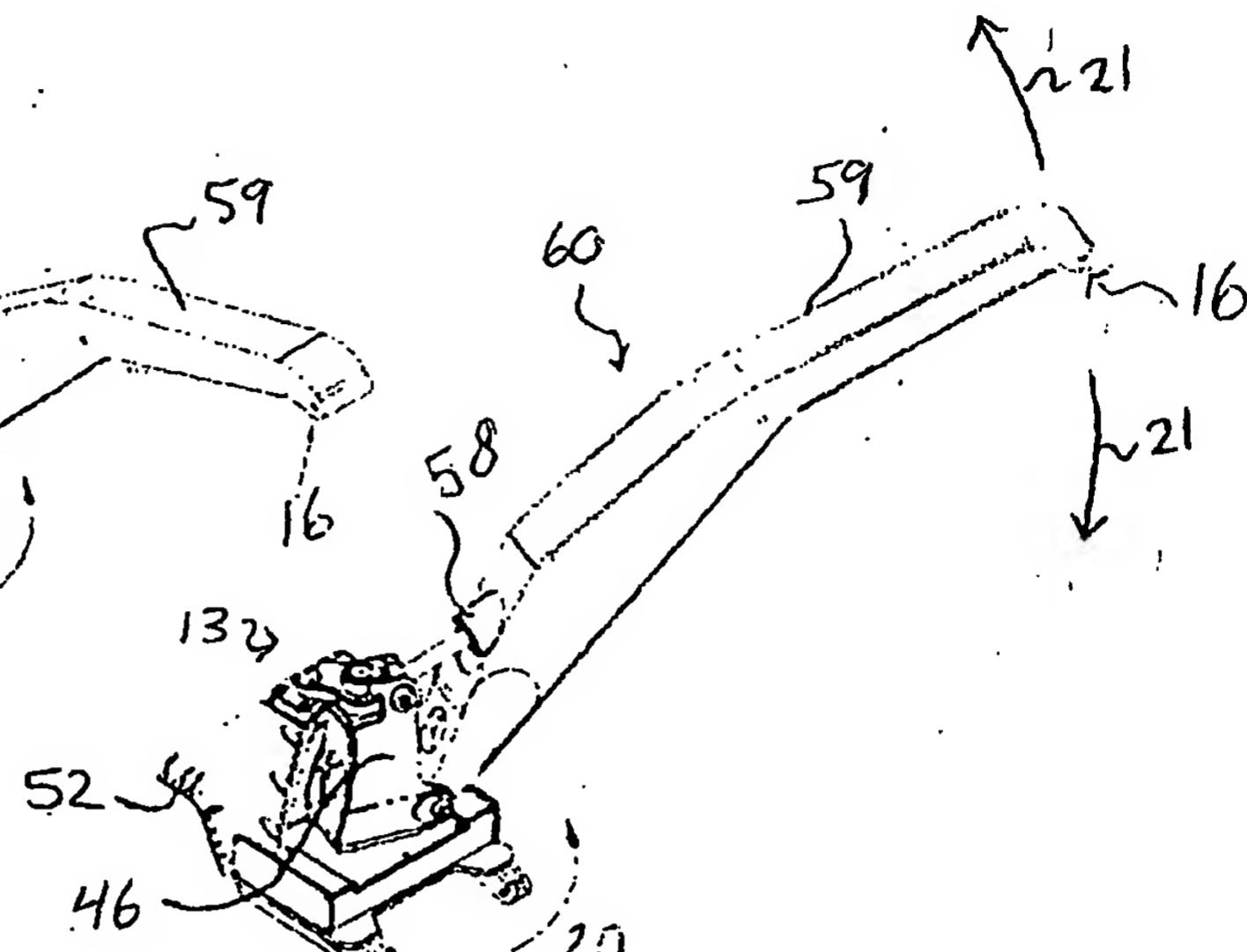


FIGURE 5B

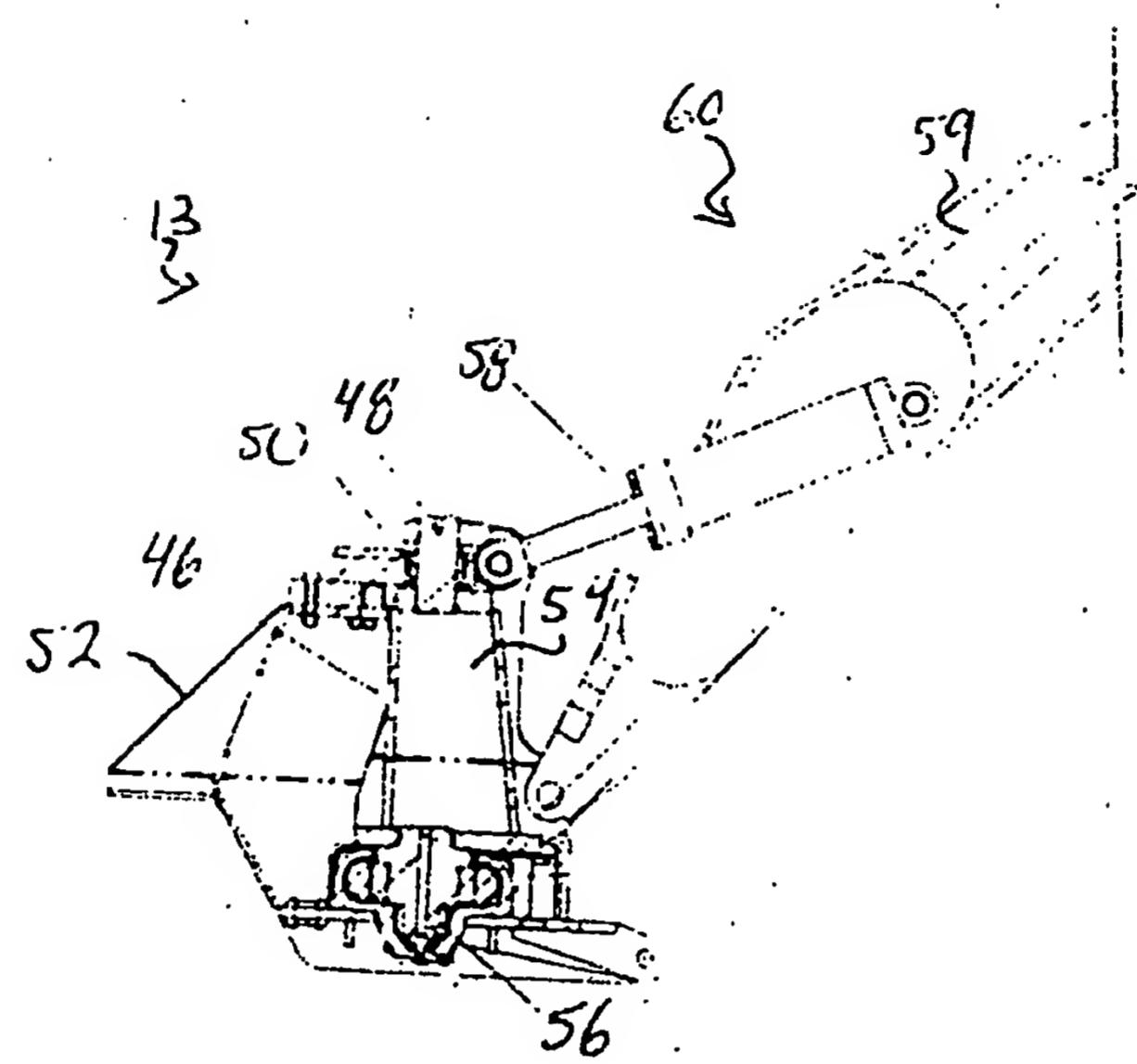


FIGURE 6

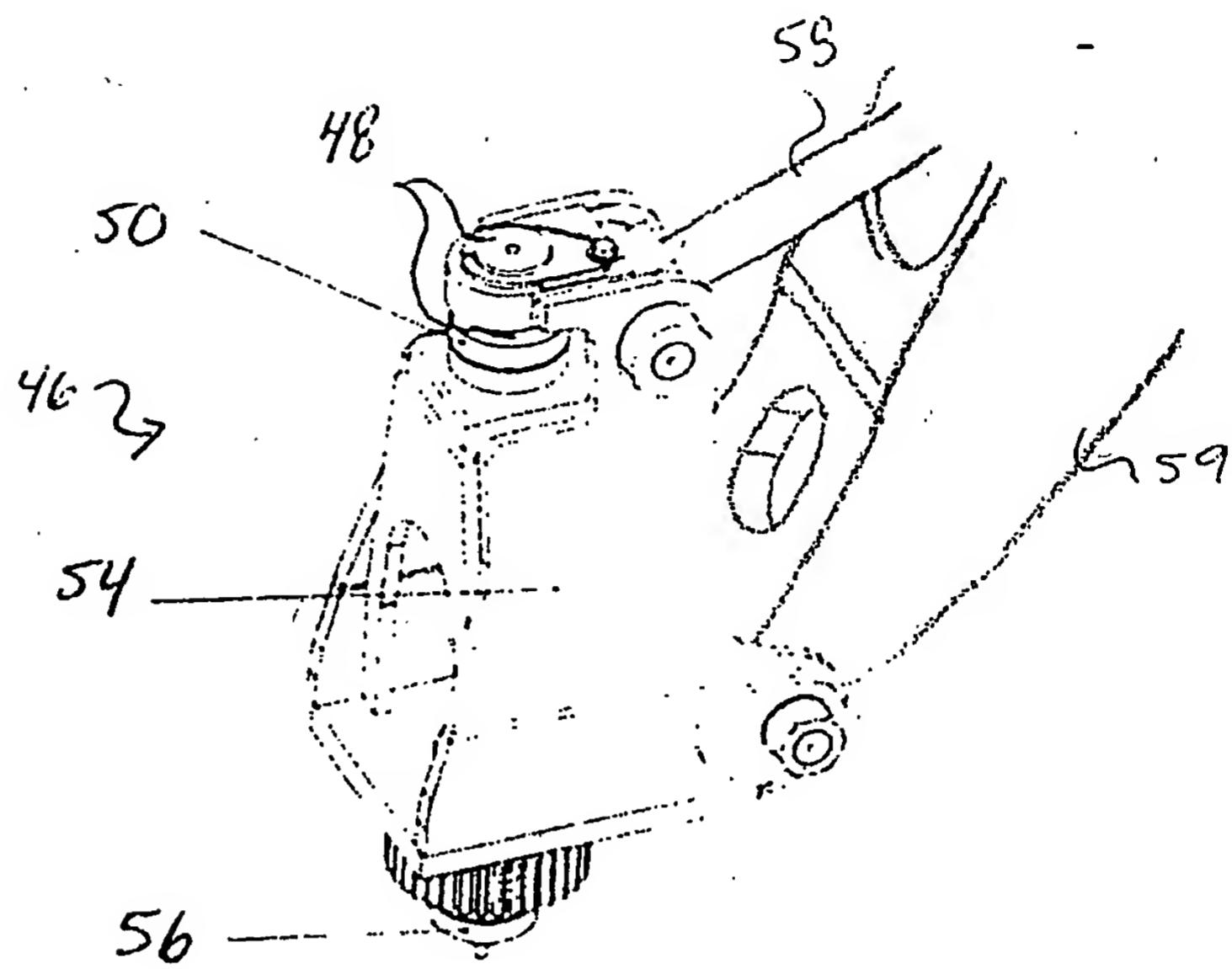


FIGURE 7

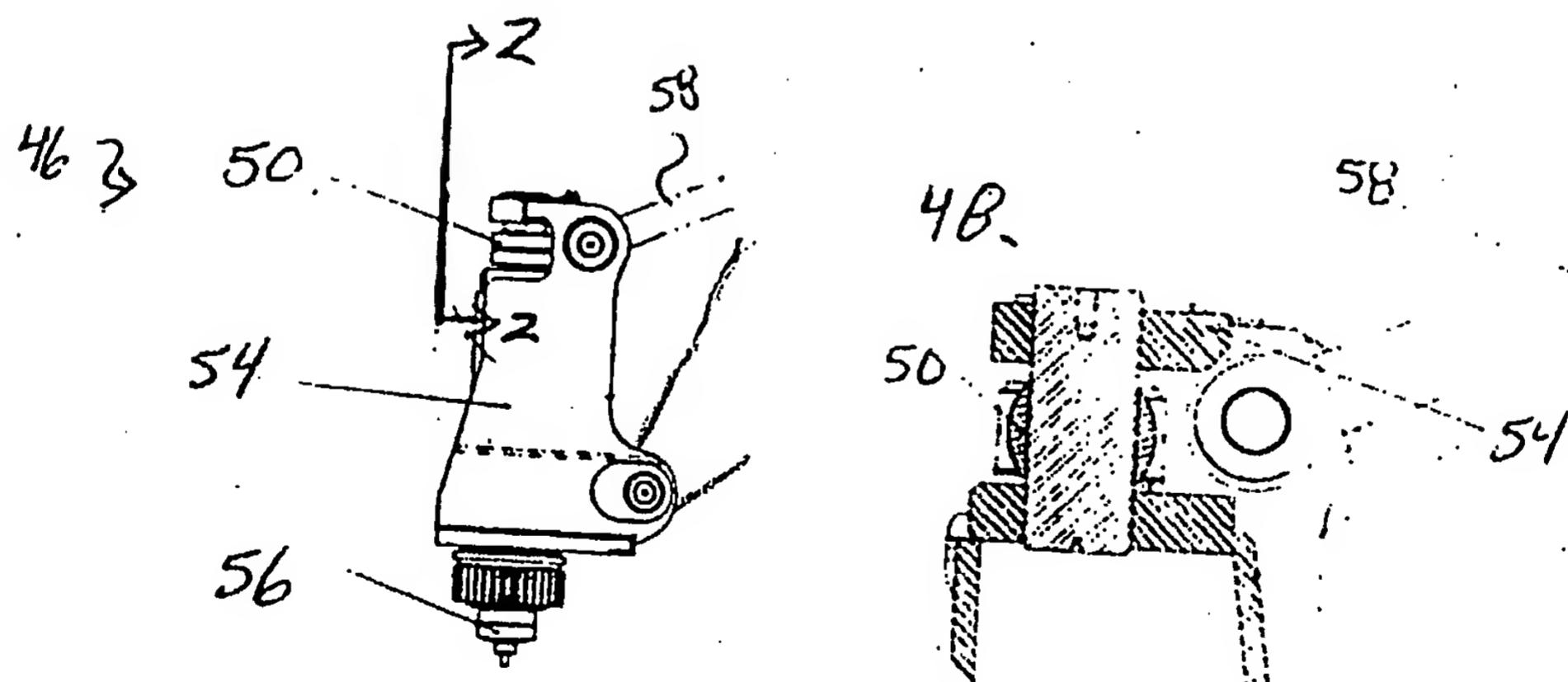


FIGURE 8

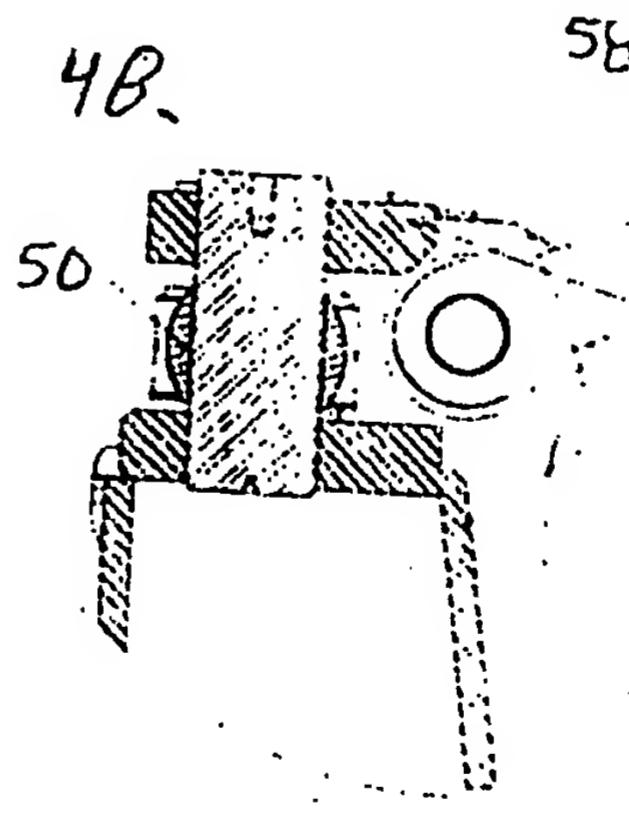


FIGURE 9

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

REC'D 26 AUG 2004

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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

		Date of mailing (day/month/year) see form PCT/ISA/210 (second sheet)
Applicant's or agent's file reference see form PCT/ISA/220		FOR FURTHER ACTION See paragraph 2 below
International application No. PCT/CA2004/000577	International filing date (day/month/year) 19.04.2004	Priority date (day/month/year) 17.04.2003
International Patent Classification (IPC) or both national classification and IPC E02F3/38, A01G23/085		
Applicant INT. SILVATECH INDUSTRIES INC.		

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Bunn, D Telephone No. +49 89 2399-2086
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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/CA2004/000577

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. **type of material:**
 - a sequence listing
 - table(s) related to the sequence listing
 - b. **format of material:**
 - in written format
 - in computer readable form
 - c. **time of filing/furnishing:**
 - contained in the international application as filed.
 - filed together with the international application in computer readable form.
 - furnished subsequently to this Authority for the purposes of search.
3. In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/CA2004/000577

Box No. II Priority

1. The following document has not been furnished:

copy of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(a)).
 translation of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or
industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	5
	No: Claims	1-4,6,7
Inventive step (IS)	Yes: Claims	
	No: Claims	1-7

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

V. Reasoned statement

1. US-A-4 015 728 (D1) discloses a swing boom assembly comprising a fixed base 42, pivot base 26, boom 16, upper shaft 13/54, clevis plates 32 and bearing 52 as specified in claim 1. It follows that the subject matter of claim 1 fails to meet the requirements of novelty, Article 33(2) PCT.
2. Concerning the additional subject matter of the dependent claims:
 - claims 2-4,6 & 7 are known from D1, and so lack novelty, Article 33(2) PCT;
 - claim 5 relates to an obvious application of the assembly of D1 in a neighbouring technical field (cf. US-A-4 127 152), and fails to involve an inventive step, Article 33(3) PCT.

VII. Certain defects in the application

1. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).